Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application.

1. (currently amended) A composition comprising:
   (a) a virus-like particle;
   (b) at least one immunostimulatory substance; and
   (c) at least one antigen or antigenic determinant;
   wherein said antigen or antigenic determinant is bound to said virus-like particle, and wherein said immunostimulatory substance is bound to said virus-like particle, and wherein said antigen comprises~~, alternatively consists essentially of, or alternatively consists of~~ a human melanoma MelanA peptide analogue.

2. (currently amended) The composition of claim 1, wherein said ~~at least one~~ antigen or antigenic determinant is bound to said virus-like particle by at least one nonpeptide covalent bond~~, and wherein preferably said covalent bond is a non-peptide bond~~.

3. (cancelled)

4. (cancelled)

5. (currently amended) The composition of ~~any of~~ claims 1 ~~to 4~~, wherein said human melanoma MelanA peptide analogue is characterized by ~~two, preferably by a single,~~ one or two amino acid substitutions with respect to the corresponding normal MelanA peptide.

6. (cancelled)

7. (currently amended) The composition of ~~any of~~ claims 1 ~~to 4~~, wherein said human melanoma MelanA peptide analogue has an amino acid sequence selected from the group consisting of:
   (a) LAGIGILTV (SEQ ID NO: 84);
   (b) MAGIGILTV (SEQ ID NO: 85);
   (c) EAMGIGILTV (SEQ ID NO: 86);
   (d) ELAGIGILTV (SEQ ID NO: 50);
   (e) EMAGIGILTV (SEQ ID NO: 87);
   (f) YAAGIGILTV (SEQ ID NO: 88); and
   (g) FAAGIGILTV (SEQ ID NO: 89).

8. (currently amended) The composition of ~~any of~~ claims 1 ~~to 4~~, wherein said human melanoma MelanA/MART-1 peptide analogue comprises~~, alternatively consists essentially of, or alternatively consists of~~ the sequence ELAGIGILTV (SEQ ID NO: 50).

9. (currently amended) The composition of ~~any of~~ claims 1 ~~to 8~~, wherein said virus-like particle comprises at least one first attachment site and wherein said antigen or antigenic determinant further comprises at least one second attachment site being selected from the group consisting of:
   (a) an attachment site not naturally occurring with said antigen or antigenic determinant; and
   (b) an attachment site naturally occurring with said antigen or antigenic determinant;

   and wherein said binding of said antigen or antigenic determinant to said virus-like particle is effected through association between said first attachment site and said second attachment site~~, wherein preferably said association is through at least one non-peptide bond~~, and wherein said antigen

or antigenic determinant and said virus-like particle interact through said association to form an ordered and repetitive antigen array.

10. (cancelled)

11. (currently amended) The composition of claim 9 ~~or 10~~, wherein said first attachment site comprises~~, or preferably consists of,~~ an amino group ~~or a lysine residue~~.

12. (currently amended) The composition of ~~any of the~~ claims 9 ~~to 11~~, wherein said second attachment site comprises~~, or preferably consists of,~~ a sulfhydryl group ~~or a cysteine residue~~.

13. (cancelled)

14. (currently amended) The composition of ~~any of the~~ claims 9 ~~to 13~~, wherein said first attachment site is an amino group and said second attachment site is a sulfhydryl group.

15. (currently amended) The composition of ~~any of the~~ claims 9 ~~to 14~~, wherein said human melanoma MelanA~~/MART-1~~ peptide analogue with said second attachment site has an amino acid sequence selected from the group consisting of:

(a) CGHGHSYTTAEELAGIGILTV (SEQ ID NO: 55);
(b) CGGELAGIGILTV (SEQ ID NO: 57);
(c) CSYTTAEELAGIGILTV ILGVL (SEQ ID NO: 58);
(d) CGGELAGIGILTVILGVL (SEQ ID NO: 59);
(e) ELAGIGILTVGGC (SEQ ID NO: 60);
(f) CSPKSLELAGIGILTV (SEQ ID NO: 92); and

(g) ELAGIGILTVILGVLGGC (SEQ ID NO: 93).

16. (currently amended) The composition of ~~any of the~~ claims 9 ~~to 14~~, wherein said human melanoma MelanA~~/MART-1~~ peptide analogue with said second attachment site has an amino acid sequence of CGHGHSYTTAEELAGIGILTV (SEQ ID NO: 55).

17. (cancelled)

18. (currently amended) The composition of ~~any one of the preceding~~ claims 1, wherein said virus-like particle is a recombinant virus-like particle, wherein ~~preferably~~ said virus like particle ~~is~~ comprises recombinant proteins selected from the group consisting of:
    (a) recombinant proteins of Hepatitis B virus;
    (b) recombinant proteins of measles virus;
    (c) recombinant proteins of Sindbis virus;
    (d) recombinant proteins of Rotavirus;
    (e) recombinant proteins of Foot-and-Mouth-Disease virus;
    (f) recombinant proteins of Retrovirus;
    (g) recombinant proteins of Norwalk virus;
    (h) recombinant proteins of human Papilloma virus;
    (i) recombinant proteins of BK virus;
    (j) recombinant proteins of bacteriophages;
    (k) recombinant proteins of RNA-phages;
    (l) recombinant proteins of Ty; and
    (m) fragments of any of the recombinant proteins from (a) to (l).

19. (cancelled)

20. (cancelled)

21. (currently amended) The composition of ~~any one of the preceding~~ claims 1, wherein said virus-like particle comprises~~, or alternatively consists essentially of, or alternatively consists of~~ recombinant proteins, or fragments thereof, of a RNA-phage, wherein ~~preferably~~ said RNA-phage is selected from the group consisting of:
    (a) bacteriophage Qβ;
    (b) bacteriophage R17;
    (c) bacteriophage fr;
    (d) bacteriophage GA;
    (e) bacteriophage SP;
    (f) bacteriophage MS2;
    (g) bacteriophage M11;
    (h) bacteriophage MX1;
    (i) bacteriophage NL95;
    (j) bacteriophage f2;
    (k) bacteriophage PP7; and
    (l) bacteriophage AP205.

22. (currently amended) The composition of ~~any one of the preceding~~ claims 1, wherein said virus-like particle comprises~~, or alternatively consists essentially of, or alternatively consists of~~ recombinant proteins, or fragments thereof, of bacteriophage Qβ or bacteriophage AP205.

23. (currently amended) The composition of ~~any one of the preceding~~ claims 1, wherein said immunostimulatory substance is a toll-like receptor activating substance or a cytokine secretion inducing substance, wherein ~~preferably~~ said toll-like receptor activating substance is selected from the group consisting of~~, or alternatively consists essentially of~~:

(a) immunostimulatory nucleic acids;
(b) peptidoglycans;
(c) lipopolysaccharides;
(d) lipoteichonic acids;
(e) imidazoquinoline compounds;
(f) flagellines;
(g) lipoproteins;
(h) immunostimulatory organic molecules;
(i) unmethylated CpG-containing oligonucleotides; and
(j) any mixtures of at least one substance of (a), (b), (c), (d), (e), (f), (g), (h) and/or (i).

24. (currently amended) The composition of claim 23, wherein said immunostimulatory nucleic acid is selected from the group consisting of~~, or alternatively consists essentially of~~:
(a) ribonucleic acids;
(b) deoxyribonucleic acids;
(c) chimeric nucleic acids; and
(d) any mixtures of at least one nucleic acid of (a), (b) and/or (c).

25. (cancelled)

26. (currently amended) The composition of claim 24, wherein said deoxyribonucleic acid is selected from the group consisting of~~, or alternatively consists essentially of~~:
(a) unmethylated CpG-containing oligonucleotides; and
(b) oligonucleotides free of unmethylated CpG motifs.

27. (currently amended) The composition of ~~any one of~~ claims 1 ~~to 24 and claim 26~~, wherein said immunostimulatory substance is an unmethylated CpG-containing oligonucleotide.

28. (currently amended) The composition of claim 27, wherein said unmethylated CpG-containing oligonucleotide comprises the sequence:

    5' X1X2CGX3X4 3'

    and wherein X1, X2, X3, and X4 are any nucleotide; and wherein at least one of said nucleotide X1, X2, X3, and X4 has a phosphate backbone modification.

29. (cancelled)

30. (currently amended) The composition of ~~any one of the preceeding~~ claims 27, wherein said ~~at least one immunostimulatory substance, and preferably said~~ unmethylated CpG-containing oligonucleotide~~,~~ comprises~~, or alternatively consists essentially of, or alternatively consists of~~ a palindromic sequence.

31. (cancelled)

32. (currently amended) The composition of claim 27, wherein said unmethylated CpG-containing oligonucleotide ~~comprises, or alternatively consists essentially of, or alternatively~~ consists of the sequence GGGGGGGGGGGACGATCGTCGGGGGGGGGG (SEQ ID NO: 41).

Claims 33-37 (cancelled)

38. (currently amended) The composition of claim 30, wherein said palindromic sequence comprises~~, or alternatively consists essentially of, or alternatively consists of~~ GACGATCGTC (SEQ ID NO: 1).

Claims 39-45 (cancelled)

46. (currently amended) A method for enhancing an immune response against an antigen in an animal comprising introducing ~~into said animal a~~ the composition of claim 1 into said animal, wherein an enhanced immune response against said antigen is produced in said animal. ~~comprising:~~

~~(a) a virus-like particle;~~

~~(b) at least one immunostimulatory substance; and~~

~~(c) at least one antigen or antigenic determinant;~~

~~wherein said antigen or antigenic determinant is bound to said virus-like particle, wherein said immunostimulatory substance is bound to said virus-like particle, and wherein said antigen comprises, alternatively consists essentially of, or alternatively consists of a human melanoma MelanA peptide analogue~~.

Claims 47-88 (cancelled)

89. (currently amended) The method of ~~any one of~~ claims 46 ~~to 87~~, wherein said immune response is an enhanced B cell response or an enhanced T cell response~~, wherein preferably said T cell response is a CTL response or a Th cell response, and wherein even more preferably said Th cell response is a Th1 cell response~~.

90. (currently amended) The method of ~~any of~~ claims 46 ~~to 89~~, wherein said animal is a mammal~~, and wherein preferably said mammal is a human~~.

91. (currently amended) The method of ~~any of~~ claims 46 ~~to 90~~, wherein said composition is introduced into said animal subcutaneously, intramuscularly, intravenously, intranasally or directly into the lymph node.

92. (currently amended) A vaccine comprising an immunologically effective amount of the composition of ~~any one of~~ claim 1 ~~to 45~~ together with a pharmaceutically acceptable diluent, carrier or excipient~~, and wherein preferably said vaccine further comprises an adjuvant~~.

93. (previously presented) A method of immunizing or treating an animal comprising administering to said animal an immunologically effective amount of the vaccine of claim 92.

94. (currently amended) The method of claim 93, wherein said animal is a mammal~~, and wherein preferably said mammal is a human~~.

95. (cancelled).

96. (cancelled).

97. (currently amended) A method of immunizing or treating an animal comprising the steps of priming a T cell response in said animal, and boosting a T cell response in said animal, wherein said priming or said boosting is effected by administering an immunologically effective amount of the vaccine of claim 92.

98. (currently amended) The method of claim 97, wherein said primimg and said boosting is effected by administering an immunologically effective amount of ~~a~~ said vaccine of claim ~~92~~ 92~~or an immunologically effective amount of a heterologous vaccine, and wherein even more preferably said heterologous vaccine is a DNA vaccine~~.

99. (new) The method of claim 89, wherein said T cell response is a CTL response or a Th cell response.

100. (new) The method of claim 99, wherein said Th cell response is a Th1 cell response.

101. (new) The method of claim 90, wherein said mammal is a human.

102. (new) The vaccine of claim 92, wherein said vaccine further comprises an adjuvant.

103. (new) The method of claim 94, wherein said mammal is a human.